[0281] Although specific examples of a GUI are illustrated in FIGS. **17**A-B, any of a variety of such GUIs can be utilized to perform processes similar to those described herein as appropriate to the requirements of specific applications in accordance with embodiments.

V. CONCLUSION

[0282] The description above discloses, among other things, various example systems, methods, apparatus, and articles of manufacture including, among other components, firmware and/or software executed on hardware. It is understood that such examples are merely illustrative and should not be considered as limiting. For example, it is contemplated that any or all of the firmware, hardware, and/or software aspects or components can be embodied exclusively in hardware, exclusively in software, exclusively in firmware, or in any combination of hardware, software, and/or firmware. Accordingly, the examples provided are not the only way(s) to implement such systems, methods, apparatus, and/or articles of manufacture.

[0283] In addition to the examples described herein with respect to stationary playback devices, embodiments of the present technology can be applied to headphones, earbuds, or other in- or over-ear playback devices. For example, such in- or over-ear playback devices can include noise-cancellation functionality to reduce the user's perception of outside noise during playback. In some embodiments, noise classification can be used to modulate noise cancellation under certain conditions. For example, if a user is listening to music with noise-canceling headphones, the noise cancellation feature may be temporarily disabled or down-regulated when a user's doorbell rings. Alternatively or additionally, the playback volume may be adjusted based on detection of the doorbell chime. By detecting the sound of the doorbell (e.g., by correctly classifying the doorbell based on received sound metadata), the noise cancellation functionality can be modified so that the user is able to hear the doorbell even while wearing noise-canceling headphones. Various other approaches can be used to modulate performance parameters of headphones or other such devices based on the noise classification techniques described herein.

[0284] The specification is presented largely in terms of illustrative environments, systems, procedures, steps, logic blocks, processing, and other symbolic representations that directly or indirectly resemble the operations of data processing devices coupled to networks. These process descriptions and representations are typically used by those skilled in the art to most effectively convey the substance of their work to others skilled in the art. Numerous specific details are set forth to provide a thorough understanding of the present disclosure. However, it is understood to those skilled in the art that certain embodiments of the present disclosure can be practiced without certain, specific details. In other instances, well known methods, procedures, components, and circuitry have not been described in detail to avoid unnecessarily obscuring aspects of the embodiments. Accordingly, the scope of the present disclosure is defined by the appended claims rather than the forgoing description of embodiments.

[0285] When any of the appended claims are read to cover a purely software and/or firmware implementation, at least one of the elements in at least one example is hereby expressly defined to include a tangible, non-transitory medium such as a memory, DVD, CD, Blu-ray, and so on, storing the software and/or firmware.

1. A method for locating a portable device in a media playback system comprising a plurality of reference devices, the method comprising:

measuring characteristics of signals transmitted via signal paths between each of a plurality of reference devices over a period of time, wherein the plurality of reference devices comprises a plurality of reference playback devices;

measuring characteristics of signals transmitted via signal paths between a portable device and each of the plurality of reference devices;

normalizing the measurements to estimate characteristics of the signal paths between each of the plurality of reference devices and between the portable device and each of the reference devices;

estimating the likelihood that the portable device is in a particular location using the estimated characteristics of the signal paths between each of the plurality of reference devices and the estimated characteristics of the signal paths between the portable device and each of the plurality of reference devices; and

identifying a target reference playback device of the plurality of reference devices based on the estimated likelihood.

2. The method of claim **1**, wherein at least some of the plurality of reference devices include different transmitter implementations.

3. The method of claim **1**, wherein the portable device has a transmitter implementation that differs from the transmitter implementations of at least one of the reference devices.

4. The method of claim **1**, wherein the measured characteristics of a particular signal comprise at least one of a received signal strength indicator (RSSI) value, an identifier for a sending reference device that transmitted the particular signal, and a timestamp for the particular signal.

5. The method of claim **1**, wherein estimating the likelihood comprises computing a set of probabilities that the portable device is near each of at least one reference device of the plurality of reference devices.

6. The method of claim **5**, wherein normalizing the measurements for a first reference device comprises:

calculating a first signal-strength ratio of signals received at the first reference device from the portable device to signals received at the first reference device from a second reference device; and

calculating a second signal-strength ratio of signals received at the second reference device from the portable device to signals received at the second reference device from the first reference device;

wherein computing the set of probabilities for the first reference device comprises computing a ratio of the first signal-strength ratio to the second signal-strength ratio.

7. The method of claim **5**, wherein normalizing the measurements for a first reference device comprises:

calculating a first signal-strength ratio of signals received at the first reference device from the portable device to signals received at the first reference device from a second reference device; and

calculating a second signal-strength ratio of signals received at a third reference device from the portable